

# YAW BRAKE REPAIR LIKE THE WIND

When damaged yaw brake discs were preventing a number of wind turbines to operate in optimum conditions, their operator was looking for an economical maintenance service that would ensure the turbine's availability. Svendborg Brakes developed a new solution to quickly restore operations. The brand of the Regal Rexnord Corporation was able to cut disc resurfacing activities and exchange pads to only three days while requiring only one and a half days of true downtime.

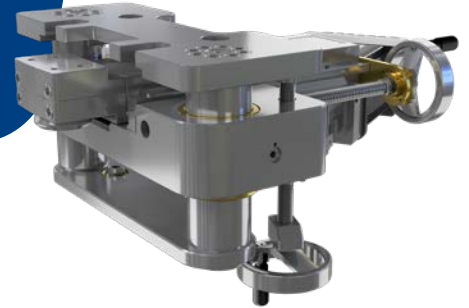
The yaw system in wind turbine generators (WTGs) have the essential role of orientating the nacelle towards the wind and holding it in position. Performing both yaw stopping and holding functions, the brakes are under constant use and are required to operate reliably. The condition of the brake disc surface is key to the brake system's performance, it must be smooth and remain free from damage.

Over time, the surface of the yaw brake will begin to suffer wear and small imperfections will appear. These imperfections will affect yaw brake performance and ultimately reduce the productivity of the WTG – eventually leading to a failure, which could cause compound damage to other components. Eventually, the brake disc will need to undergo a resurfacing process to eliminate the imperfections; this is traditionally a time-consuming task.

Many operators accept the downtime caused by disc resurfacing as an unwelcome but essential chore. However, when one custodian of a number of WTGs off the coasts of Denmark and the UK identified that several of their yaw brakes were damaged, they were keen to find a solution that could expedite the process.

## A WIND OF CHANGE

In this case, the turbine operator was keen to minimise any downtime associated with disc resurfacing operations. To do so, it contacted Svendborg Brakes, a part of Regal Rexnord, and asked it to develop a solution that would address the requirement of removing the brake systems from the tower. The company was selected on the basis of its comprehensive services for brake repair in wind turbines, which is already proven to eliminate the need for intervention from multiple contractors during maintenance and repair operations.



## HIGHLIGHTS

- Svendborg Brakes DRT gen2 tool remilled the damaged disc surface
- The turbine nacelle did not need to be removed to resurface, resulting in a major cost savings.
- Remilling discs on-site reduces risk of damage and significantly lowers future downtime and maintenance costs



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*Continued from front*

Thanks to its extensive expertise in braking systems and its suite of components that are manufactured in-house, Svendborg Brakes was able to develop an innovative, portable disc resurfacing tool. This consists of a milling machine that quickly repairs the disc onsite while minimising the quantity of fine dust produced during the process. The groundbreaking tool is extremely compact and lightweight, allowing it to be easily transported to the top of the wind turbine.

The disc resurfacing tool is mounted utilising one of the yaw brake mounting positions. Consequently, it offers an easy to install and minimally invasive procedure.

Furthermore, the disc resurfacing tool can be operated manually or automatically, via single-axis computer numerical control (CNC). The latter is achieved by utilising the company's proprietary software. More precisely, it is possible to map the surface of the disc to create a CNC machining profile that the disc resurfacing tool uses to accurately follow the disc.

James Woods, Senior Project Manager, Engineering & Test at Svendborg Brakes, comments: "With only 1 mm thickness of material removed from the disc, the solution we developed was able to exceed our expectations, delivering an end result of extremely high quality. Even more, the process is extremely fast, with less than a day required to repair the disc."

## MORE THAN A STRAW IN THE WIND

As a full-service provider of braking solutions, Svendborg Brakes was able to combine further elements to streamline the entire maintenance process. Firstly, the repair team could utilise an LBS yaw brake lifting tool developed in-house to quickly and easily remove the brake pads from the disc as well as reinstall them afterwards. In this way, the entire project could be completed in a record time of three days. In addition, the specialised teams were able to perform a complete pad exchange within this timeframe.

Also, the company's expertise in wind turbine operations and yaw brake systems was crucial to bypass dismantled components and allow the WTG to run during the night. As a result, it was possible for the operators to generate power for at least 12 hours every day, leading to a total of only one and a half days of downtime.

After the successful development of a new disc resurfacing tool and its adoption for the repair of wind turbines off the coasts of Denmark and the UK, Svendborg Brakes is already discussing future projects with the WTG operator as well as other businesses in the wind energy sector.

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